FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT

U.S. Department of Energy
Office of Science
Office of Advanced Scientific Computing Research

Software Development Tools for
Improved Ease-of-Use of Petascale Systems

Funding Opportunity Number: DE-PS02-08ER08-19
Announcement Type: Initial
CFDA Number: 81.049

ISSUE DATE: **04/09/2008**

Letters of Intent Due Date: May 12, 2008, 5:00 PM Eastern Time (Required)

Application Due Date: **July 18, 2008, 8:00 PM Eastern Time**

NOTE: REQUIREMENTS FOR GRANTS.GOV

Where to Submit: Applications must be submitted through Grants.gov to be considered for award. You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately. Remember you have to update your CCR registration annually. If you have any questions about your registration, you should contact the Grants.gov Helpdesk at 1-800-518-4726 to verify that you are still registered in Grants.gov.

Registration Requirements: There are several one-time actions you must complete in order to submit an application through Grants.gov (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), register with the credential provider, and register with Grants.gov). See http://www.grants.gov/GetStarted. Use the Grants.gov Organization Registration Checklist at http://www.grants.gov/assets/OrganizationRegCheck.doc to guide you through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in the CCR registration process. Applicants, who are not registered with CCR and Grants.gov, should allow at least 21 days to complete these requirements. It is suggested that the process be started as soon as possible.

IMPORTANT NOTICE TO POTENTIAL APPLICANTS: When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

MICROSOFT VISTA AND OFFICE 2007 COMPATIBILITY: Grants.gov is currently incompatible with both the new Microsoft (MS) Vista Operating System and the new Microsoft (MS) Office 2007 versions of Word, Excel and Power Point. If you attach a file created using MS Office 2007, you will not get an error message when you submit the application, HOWEVER your entire application will not be able to be processed or accepted at Grants.gov and will not reach DOE.

Microsoft Windows Vista users: Please note that PureEdge does not work with Microsoft Windows Vista at this time. Grants.gov provides an alternative solution at: http://www.grants.gov/resources/download_software.jsp#citrixnonwindow <http://www.grants.gov/resources/download_software.jsp>

The default file format used by Microsoft Office 2007 presents compatibility issues with Grants.gov. For solutions to the Office 2007 compatibility issue, go to: http://www07.grants.gov/help/submit_application_faqs.jsp

Otherwise, you must find a computer with a previous version Microsoft Operating System, such as Windows XP.

Grants.gov can accept applications with attachments created in MS Office 2007 if the attachments are saved in the prior format. See: <http://www.grants.gov/assets/Vista_and_office_07_Compatibility.pdf> for detailed instructions on how to do this. A file created in MS Office 2007 can be identified by the "x" at the end of the file extension, for example "sample.docx" for a Word file.

Contact Grants.gov at 1-800-518-4726 with any questions.

Questions: Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. Part VII of this announcement explains how to submit other questions to the Department of Energy.

Application Receipt Notices: After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the e-mails. It may take up to two (2) business days from application submission to receipt of e-mail Number 2. When the AOR receives e-mail Number 5, it is their responsibility to follow the instructions in the e-mail to logon to IIPS and verify that their application was received by DOE. The titles of the five e-mails are:

Number 1 – Grants.gov Submission Receipt Number
Number 2 – Grants.gov Submission Validation Receipt for Application Number
Number 3 – Grants.gov Grantor Agency Retrieval Receipt for Application Number
Number 4 – Grants.gov Agency Tracking Number Assignment for Application Number
Number 5 – DOE e-Center Grant Application Received

The last e-mail will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last e-mail changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This e-mail will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

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F. Intellectual Property Developed under this Program
G. Notice of Right to Request Patent Waiver
H. Notice Regarding Eligible/Ineligible Activities

PART I – FUNDING OPPORTUNITY DESCRIPTION

GENERAL INQUIRIES ABOUT THIS FOA SHOULD BE DIRECTED TO:

Dr. Fred Johnson
Phone: (301) 903-5800
Email: fjohnson@ascr.doe.gov

SUMMARY:

The Office of Advanced Scientific Computing Research (ASCR) of the Office of Science (SC), U.S. Department of Energy (DOE), hereby announces its interest in receiving applications for research grants in software development tools for improved ease-of-use of petascale systems.

Petascale computing systems soon will be available to the DOE science community. Such systems will exhibit increased architectural complexity and tens to hundreds of thousands of processor cores. Increased architectural complexity includes multicore/heterogeneous CPUs, novel memory systems and intelligent interconnects. Applications are also becoming more complex with a variety of languages, libraries, programming models, data structures, and algorithms in a single application. Taken together, these trends generate a critical need for tools that can help application teams address severe complexity and scalability challenges.

Software development tools serve as a key interface between application teams and target HPC architectures. Broadly speaking, tool functionality can be decomposed into three categories: correctness tools which support the rapid debugging of complex code, performance tools for identifying and removing performance bottlenecks, and development environments which enable the efficient generation and test of complex codes and code frameworks. Both correctness and performance tools must be fully scalable in order to address subtle problems that may be manifested only at large scale, and they must rely on scalable infrastructures that support tool communication, data management, binary manipulation of application executables, and a variety of other capabilities.

This announcement is focused on research and development for innovations in petascale tools in each of these areas: correctness tools, performance tools, scalable tool infrastructure and development environments. The activities supported by this notice may be a combination of basic and applied research, development, prototyping, testing and ultimately deployment. Partnerships among universities, National Laboratories, and industry are encouraged.

SUPPLEMENTARY INFORMATION:

Software development tools enable application teams to effectively use large scale systems for the efficient execution of complex scientific applications. They are essential to the success of both large scale systems and complex applications. Next generation petascale systems will have tens to hundreds of thousands of processors, an unprecedented level of complexity, and will require significant new levels of scalability and functionality in software tools. A new and innovative generation of software development tools is needed to meet and surpass application requirements for scalability, functionality, reliability, and ease of use.

The complexity and scale of petascale systems and large application codes represent major challenges for development tools including: radical increases in node and processor core counts, support for multi-mode parallelism, reduced memory per core, heterogeneous nodes, and support for fault tolerance. Application developer and user needs for these systems include: a means for debugging at scale, increased support for memory debugging, memory characterization tools, both lightweight and heavyweight tools, performance analysis tool support for serial code segments, multithreaded segments and multimode segments, and means for understanding and optimizing for topology related performance.

The research activities supported by this activity need to bridge the gap between large complex applications and next-generation hardware, including interactions with novel architectures. Consequently, there are a wide variety of research topics that are appropriate for this effort. Example candidate topics are provided below, but research in other relevant areas and combinations of areas is encouraged.

Performance Tools

Automated Diagnosis and Remediation -- New approaches to performance optimization which move beyond manual methods and enable greater automation and which support automation of diagnosis, optimization and anomaly detection.

Load Imbalance Detection – Highly scalable methodology for detecting load imbalance in applications running on hundreds of thousands of processor cores. Tools which provide root cause analysis in addition to detection.

Heterogeneous, Hierarchical Architecture Support -- Performance tools which support multilevel parallel paradigms, including hybrid OpenMP/MPI programs. Tools which capture and relate performance and reliability problems to source code in ways that make multilevel performance optimization possible and practical.

Correctness Tools

Scalable Debuggers – Both lightweight and heavyweight approaches to scalable debugging that support of ease of use, error detection at scale, and in-depth root cause analyses.

Memory Usage – Both lightweight and heavyweight tools for monitoring memory utilization (especially memory leaks and overall memory consumption) and tools to find programming errors in the way memory is accessed.

Thread Correctness -- Multi-platform tools that enable users to detect incorrect use of parallel programming techniques including thread correctness checkers and Message Passing Interface (MPI) usage checkers. Tools which assess the validity of memory references, track locks that are held when memory is accessed and verify that no potential race condition exists.

Scalable Infrastructure

Data Management and Communication -- Support for all aspects of the gathering, reduction, and storage of application information and metadata. Support for communicating information among tool components on different nodes, getting information from external sources such as the operating system, compiler, scheduler, and runtime system, and exchanging information between tools.

Scheduler and Operating System Interaction – Support for close coordination of tools with the scheduler, e.g. for tool launch on multiple nodes, and the operating system , e.g. process control interfaces for access to thread information and low overhead access to hardware counters.

Binary Manipulation – Support for binary analysis of optimized and stripped programs, and the ability to generate new binaries with instrumentation.

Development Environment

Application Build Tools – Tool support for radical improvements in the management of the application build process that address the complexities arising from multiple target systems, operating systems, libraries and software versions. Also support for common option sets, command line interfaces, shared libraries and dynamic link order.

Mixed Language Environments – Tool support for mixed language programming including traditional languages, Fortran, C, C++; scripting languages, Python; and emerging languages such as the PGAS languages UPC, Co-array Fortran and the HPCS languages.

Compiler Infrastructure -- A flexible, extendible, portable, open source compiler infrastructure to support efficient information transfer between compile time analyses and tools and runtime analyses and tools.

Program Transformations – Tools supporting source-to-source transformations to enable codes to automatically adapt to new computer architectures achieve maximum architecture independence and efficiently use complex libraries.

Integrated Development Environments (IDEs) – Integrated frameworks supporting the effective integration of development and runtime environments and achieve significant improvements in programmer productivity in the creation of complex application codes.

References

These example research topics represent only a portion of the research challenges for petascale tools. All interested proposers are strongly encouraged to study the following references for additional discussion insight:

Software Development Tools for Petascale Computing Workshop Presentations:

http://www.csm.ornl.gov/workshops/Petascale07/presentations.html

Software Development Tools for Petascale Computing Workshop Final Report:
http://www.csm.ornl.gov/workshops/Petascale07/sdtpc_workshop_report.pdf

Community Building

An important goal of this notice is to foster active, integrated research community in petascale tools for high end systems. Consequently the following are mandatory requirements for awardees:

- All developed code must be released under the most permissive open source license possible. This is to enable other researchers and vendors to build upon research successes with a minimum of intellectual property issues.

- Each research team should plan to send representatives to annual PI meetings and give presentations on the status and promise of their research. Meeting attendees will include invited participates from other relevant research communities. The objectives of these meetings include fostering a sense of community and serving as a venue for exchange of information with complementary programs including the DARPA HPCS program, NSF programs in CISE and OCI, NNSA ASC program, and the DOE/SC SciDAC program.

Testbed Access

Applications should provide a plan for utilizing leadership class systems at Oak Ridge National Laboratory and Argonne National Laboratory and systems at the National Energy Research Scientific Computing Center (NERSC) at Lawrence Berkeley National Laboratory for the purpose of software testing at scale. Each application should contain a section which discusses the characteristics of the test environments necessary for the research and identify the time frames in which specific testbed support will be required. Since relatively limited amounts of testing time will be available on these systems, the individual testing plans will be used to develop an overall test plan for the program.

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT.

DOE anticipates awarding grants under this program announcement.

B. ESTIMATED FUNDING.

It is anticipated that up to $3 million annually will be available for multiple awards for this program. Awards are planned to be made in Fiscal Year 2009, and applications may request project support for up to three years. Annual budgets for successful projects are expected to range from $250,000 to $700,000 per project although smaller projects of exceptional merit may be considered. Annual budgets may increase in the out-years but should remain within the overall annual maximum guidance. All awards are contingent on the availability of funds and programmatic needs. DOE is under no obligation to pay for any costs associated with the preparation or submission of an application. DOE reserves the right to fund, in whole or part, any, all, or none of the applications submitted in response to this Notice.

C. MAXIMUM AND MINIMUM AWARD SIZE.

See B. Estimated Funding section above.

D. EXPECTED NUMBER OF AWARDS.

See B. Estimated Funding section above.

E. ANTICIPATED AWARD SIZE.

See B. Estimated Funding section above.

F. PERIOD OF PERFORMANCE.

See B. Estimated Funding section above.

G. TYPE OF APPLICATION.

DOE will accept new applications under this Announcement.

PART III - ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS.

All types of domestic entities are eligible to apply, except other Federal agencies, Federally Funded Research and Development Center (FFRDC) Contractors, and nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995.

B. COST SHARING.

Cost sharing is not required.

C. OTHER ELIGIBILITY REQUIREMENTS.

N/A

PART IV – APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE.

Application forms and instructions are available at Grants.gov. To access these materials, go to http://www.grants.gov, select "Apply for Grants", and then select "Download Application Package". Enter the CFDA and/or the funding opportunity number located on the cover of this announcement and then follow the prompts to download the application package.

B. LETTER OF INTENT AND PREAPPLICATION.

1. Letter of Intent.

Potential applicants are REQUIRED to submit a two-page Letter of Intent (LOI) by email to petascaletools@ascr.doe.gov. The subject line of the email should be: "Letter of Intent for Announcement DE-PS02-08ER08-19". The LOI should be a Word file attached to the email. No FAX or mail submission of Letters of Intent will be accepted. **Letters of Intent must be received by May 12, 2008, 5:00 p.m., Eastern Time.**

The purpose of a LOI is to save the time and effort of applicants in preparing and submitting a formal project application that may be inappropriate for the program. Letters of Intent also assist ASCR in planning the peer review process and the selection of properly qualified reviewers.

Letters of Intent should consist of no more than two pages total. The LOI should provide (1) the Principal Investigator's name, telephone number, and email address; (2) the name of the Principal Investigator's employing institution; (3) the title of the proposed research; (4) a clear and concise description of the proposed research and research objectives; (5) a statement of background and significance of the proposed project; (6) a rough dollar approximation of the budget for each year of the proposed research; (7) a curriculum vita that highlights the Principal Investigator's expertise and background in successful research related to the subject of this announcement and the proposed research; and (8) the proposed research team and brief statements of their expertise. A Word form for the LOI is available at: http://www.science.doe.gov/ascr/Research/08CSSolicit.html, submitters are strongly encouraged to use this form for their LOI submission.

Letters of Intent will be reviewed for conformance with the guidelines and technical areas provided in this announcement. **A response to a LOI encouraging or discouraging formal applications will be communicated to all applicants by May 26, 2008.** Applicants who have not received a response regarding the status of their LOI by this date are responsible for contacting the program to confirm their status. **Formal applications will be accepted only from those encouraged to submit a formal application in response to their LOI. No other formal applications will be considered.**

2. **Preapplication.**

   Preapplications are not required.

C. CONTENT AND FORM OF APPLICATION – SF 424 (R&R).

You must complete the mandatory forms and any applicable optional forms (e.g., SF-LLL-Disclosure of Lobbying Activities) in accordance with the instructions on the forms and the additional instructions below**. Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement.**

1. **SF 424 (R&R).**
   Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. To activate the instructions, turn on the "Help Mode" (Icon with the pointer and question mark at the top of the form). The list of certifications and assurances referenced in Field 18 can be found on the Applicant and Recipient Page at: http://management.energy.gov/business_doe/business_forms.htm, under Certifications and Assurances.

2. **RESEARCH AND RELATED Other Project Information.**
   Complete questions 1 through 5 and attach files. The files must comply with the following instructions:

   Project Summary/Abstract (Field 6 on the Form).
   The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s) (PD/PI), the project title, the objectives of the project, the hypotheses to be tested, the proposed experimental design, the names of **all investigators** and their affiliations, and the potential impact of the project (i.e., benefits, outcomes). This document must not include any proprietary or sensitive business information as the Department may make it available to the public. The project summary must not exceed 1 page when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) with font not smaller than 11 point. To attach a Project Summary/Abstract, click "Add Attachment."

   Project Narrative (Field 7 on the form).
   The project narrative for an **Application must not exceed 15 pages** of technical information, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right). EVALUATORS WILL ONLY REVIEW THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE. The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that

provide information necessary to review the application, because the information contained in these sites will not be reviewed. See Part VIII.D for instructions on how to mark proprietary application information. To attach a Project Narrative, click "Add Attachment."

The first page of your narrative must include the following information (this page will not count in the project narrative page limitation):

Applicant/Institution:
Street Address/City/State/Zip:
Principal Investigator:
Address:
Telephone Number:
Email:
DOE/Office of Science Program Office:
DOE/Office of Science Program Office Technical Contact:
DOE Grant Number (if Renewal or Supplemental Application):

Is this a Collaboration? If yes, please list ALL Collaborating Institutions/PIs* and indicate which ones will also be submitting applications.

**** Note that collaborating applications must be submitted separately.***

The narrative comprises the research plan for the project. Letters of intent from all collaborators and short curriculum vitae of all senior personnel must be included in the application. Applications not meeting these requirements will be deemed ineligible during the initial screening process. The major part of the narrative should be devoted to a description and justification of the proposed project, including details of the methods to be used. It should also include a timeline for the major activities of the proposed project, and should indicate which project personnel will be responsible for which activities.

The project narrative must include:

Project Objectives:
This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.

Project Timetable:
This section should outline as a function of time, year by year, all the important activities or phases of the project, including any activities planned beyond the project period. Successful applicants must use this project timetable to report progress.

Project Performance Site:
Indicate the primary site where the work will be performed. If a portion of the work will be performed at any other sites, identify those sites, also.

Biographical Sketch Appendix:

Provide a biographical sketch for the project director/principal investigator (PD/PI) and each senior/key person listed in Section A on the R&R Budget form. **Provide the biographical sketch information as an appendix to your project narrative. Do not attach a separate file.** The biographical sketch appendix will not count in the project narrative page limitation. The biographical information for each person must not exceed 2 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point and must include:

Education and Training. Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.

Research and Professional Experience: Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

Publications. Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically.

Patents, copyrights and software systems developed may be provided in addition to or substituted for publications.

Synergistic Activities. List no more than 5 professional and scholarly activities related to the effort proposed.

Current and Pending Support Appendix.
Provide a list of all current and pending support (both Federal and non-Federal) for the Project Director/Principal Investigator(s) (PD/PI) and senior/key persons, including subawardees, for ongoing projects and pending applications. For each organization providing support, show the total award amount for the entire award period (including indirect costs) and the number of person-months per year to be devoted to the project by the senior/key person. **Provide the Current and Pending Support as an appendix to your project narrative. Do not attach a separate file. The Current and Pending Support Appendix will not count in the project narrative page limitation.** Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review.

Identification of Potential Conflicts of Interest or Bias in Selection of Reviewers Appendix.

Provide the following information in this appendix and append to your project narrative. Do not attach a separate file. (This appendix will not count in the project narrative page limitation):

Collaborators and Co-editors: List in alphabetical order all persons, including their current organizational affiliation, who are, or who have been, collaborators or co-authors with you on a research project, book or book article, report, abstract, or paper during the 36 months preceding the submission of this application. Also, list any individuals who are currently, or have been, co-editors with you on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding the submission of this application. If there are no collaborators or co-editors to report, state "None."

Graduate and Postdoctoral Advisors and Advisees: List the names and current organizational affiliations of your graduate advisor(s) and principal postdoctoral sponsor(s) during the last 5 years. Also, list the names and current organizational affiliations of your graduate students and postdoctoral associates during the past 5 years.

Bibliography & References Cited Appendix.
Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application. In order to reduce the number of files attached to your application, please provide the Bibliography and References Cited information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.

Facilities & Other Resources Appendix. This information is used to assess the capability of the organizational resources, including subawardee resources, available to perform the effort proposed. Identify the facilities to be used (Laboratory, Animal, Computer, Office, Clinical and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. In order to reduce the number of files attached to your application, please provide the Facility and Other Resource information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.

Equipment Appendix.
List major items of equipment already available for this project and, if appropriate identify location and pertinent capabilities. In order to reduce the number of files attached to your application, please provide the Equipment information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.

Other Attachment Appendix.
If you need to elaborate on your responses to questions 1-5 on the "Other Project Information" document, please provide this information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.

Do not attach files for fields 8, 9, 10, and 11, instead follow the above instructions to include the information as appendices to the project narrative file (these appendices will not count in the project narrative page limitation).

3. RESEARCH AND RELATED BUDGET.

Complete the Research and Related Budget form in accordance with the instructions on the form (Activate Help Mode to see instructions) and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See PART IV, G).

Budget Justification (Field K on the form).
Provide the required supporting information for the following costs (See R&R Budget instructions): equipment; domestic and foreign travel; participant/trainees; material and supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. **Attach a single budget justification file for the entire project period in Field K.** The file automatically carries over to each budget year.

4. SF-LLL Disclosure of Lobbying Activities.
If applicable, complete SF- LLL. Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying."

Summary of Required Forms/Files

Your application must include the following documents:

Name of Document	Format	Attach to
SF 424 (R&R)	PureEdge Form	N/A
RESEARCH AND RELATED Other Project Information	PureEdge Form	N/A
Project Summary/Abstract	PDF	Field 6
Project Narrative, including required appendices	PDF	Field 7
RESEARCH & RELATED BUDGET	PureEdge Form	N/A
Budget Justification	PDF	Field K

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS.

If selected for award, DOE reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information
- Other budget information
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Commitment Letter from Third Parties Contributing to Cost Sharing, if applicable

E. SUBMISSION DATES AND TIMES.

1. Letter of Intent Due Date.

Potential applicants are REQUIRED to submit a two-page Letter of Intent (LOI) by email to petascaletools@ascr.doe.gov. The subject line of the email should be: "Letter of Intent for Announcement DE-PS02-08ER08-19". The LOI should be a Word file attached to the email. No FAX or mail submission of Letters of Intent will be accepted. **Letters of Intent must be received by May 12, 2008, 5:00 p.m., Eastern Time.**

2. Preapplication Due Date.

Preapplications are not required.

3. Formal Applications.

Formal applications submitted in response to this Announcement must be received by July 18, 2008, 8:00 p.m. Eastern, to permit timely consideration of awards in Fiscal Year 2008. **You are encouraged to transmit your application well before the deadline. APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.**

F. INTERGOVERNMENTAL REVIEW.

This program is not subject to Executive Order 12372 Intergovernmental Review of Federal Programs.

G. FUNDING RESTRICTIONS.

Cost Principles**.** Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600.

Pre-award Costs**.** Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS.

1. Where to Submit.

APPLICATIONS MUST BE SUBMITTED THROUGH GRANTS.GOV TO BE CONSIDERED FOR AWARD. Submit electronic applications through the "Apply for Grants" function at www.Grants.gov. If you have problems completing the registration process or submitting your application, call Grants.gov at 1-800-518-4726 or send an email to support@grants.gov.

2. Registration Process.

You must COMPLETE the one-time registration process (all steps) before you can submit your first application through Grants.gov (See www.grants.gov/GetStarted). **We recommend that you start this process at least three weeks before the application due date**. It may take 21 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at http://www.grants.gov/assets/OrganizationRegCheck.doc to guide you through the process. IMPORTANT: During the CCR registration process, you will be asked to designate an E-Business Point of Contact (EBIZ POC). The EBIZ POC must obtain a special password called "Marketing Partner identification Number" (MPIN). When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

3. **Application Receipt Notices.**

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Number 4 - Grants.gov Agency Tracking Number Assignment for Application Number
Number 5 – DOE e-Center Grant Application Received

The last email will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last email changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This email will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

Part V - APPLICATION REVIEW INFORMATION

A. CRITERIA.

1. Initial Review Criteria.

Prior to a comprehensive merit evaluation, DOE will perform an initial review in accordance with 10 CFR 605.10(b).

2. Merit Review Criteria.

Applications will be subjected to scientific merit review (peer review) and will be evaluated against the following evaluation criteria listed in descending order of importance as codified at 10 CFR 605.10(d):

1. Scientific and/or Technical Merit of the Project
2. Appropriateness of the Proposed Approach and Methods
3. Competency of the Research Team and Adequacy of Available Resources
4. Justification of the Proposed Budget.

The evaluation will include program policy factors such as the relevance of the proposed research to the terms of the announcement and the agency's programmatic needs. It should be noted that external peer reviewers are selected on the basis of their scientific expertise and the absence of conflict-of-interest issues. Non-federal reviewers may be used, and submission of an application constitutes agreement that this review process is acceptable to the investigator(s) and the submitting institution.

B. REVIEW AND SELECTION PROCESS.

1. Merit Review.

Applications that pass the initial review will be subjected to a merit review in accordance with the guidance provided in the "Office of Science Merit Review System for Financial Assistance." This Merit Review System is available at: http://www.science.doe.gov/grants/merit.html.

2. Selection.

The Selection Official will consider the merit review recommendation, program policy factors, and the amount of funds available.

3. Discussions and Award.

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR part 600 and 605; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES.

DOE intends to make awards in FY 2009.

Part VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES.

1. Notice of Selection.
DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. (See Part IV.G with respect to the allowability of pre-award costs.)

Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

2. Notice of Award.
A Notice of Financial Assistance Award issued by the contracting officer is the authorizing award document. It normally includes, either as an attachment or by reference: 1. Special Terms and Conditions; 2. Applicable program regulations, if any; 3. Application as approved by DOE; 4. DOE assistance regulations at 10 CFR Part 600, or, for Federal Demonstration Partnership (FDP) institutions, the FDP terms and conditions; 5. National Policy Assurances to Be Incorporated As Award Terms; 6. Budget Summary; and 7. Federal Assistance Reporting Checklist, which identifies the reporting requirements.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS.

1. Administrative Requirements.

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR Part 600 and 10 CFR Part 605 (See: http://ecfr.gpoaccess.gov), except for grants made to Federal Demonstration Partnership (FDP) institutions. The FDP terms and conditions and DOE FDP agency specific terms and conditions are located on the National Science Foundation web site at http://www.nsf.gov/awards/managing/fed_dem_part.jsp.

2. Special Terms and Conditions and National Policy Requirements.

Special Terms and Conditions and National Policy Requirements.
The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at http://management.energy.gov/business_doe/business_forms.htm. The National Policy Assurances to Be Incorporated As Award Terms are located at http://management.energy.gov/business_doe/business_forms.htm.

Intellectual Property Provisions.
The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at http://www.gc.energy.gov/financial_assistance_awards.htm.

C. REPORTING.

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F4600.2, attached to the award agreement.

PART VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS.

Questions regarding the content of the announcement must be submitted through the "Submit Question" feature of the DOE Industry Interactive Procurement System (IIPS) at http://e-center.doe.gov. Locate the program announcement on IIPS and then click on the "Submit Question" button. Enter required information. You will receive an electronic notification that your question has been answered. DOE will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. DOE cannot answer these questions.

B. AGENCY CONTACT:

GENERAL INQUIRIES ABOUT THIS NOTICE SHOULD BE DIRECTED TO:

Agency Contact:

Dr. Fred Johnson
Phone: (301) 903-5800
Email: fjohnson@ascr.doe.gov

PART VIII - OTHER INFORMATION

A. MODIFICATIONS.

Notices of any modifications to this announcement will be posted on Grants.gov and the DOE Industry Interactive Procurement System (IIPS). You can receive an email when a modification or an announcement message is posted by joining the mailing list for this announcement through the link in IIPS. When you download the application at Grants.gov, you can also register to receive notifications of changes through Grants.gov.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE.

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement and to select any application, in whole or in part, as a basis for negotiation and/or award.

C. COMMITMENT OF PUBLIC FUNDS.

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

D. PROPRIETARY APPLICATION INFORMATION.

Patentable ideas, trade secrets, proprietary or confidentional commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and specifies the pages of the application which are to be restricted:

"The data contained in pages _____ of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government's right to use or disclose data obtained without restriction from any source, including the applicant."

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

"The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation."

E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL.

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application.

Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM.

Patent Rights. The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See "Notice of Right to Request Patent Waiver" in paragraph G below.)

Rights in Technical Data. Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE's own needs or to insure the commercialization of technology developed under a DOE agreement.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER.

Applicants may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this announcement, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.

Domestic small businesses and domestic nonprofit organizations will receive the patent rights clause at 37 CFR 401.14, i.e., the implementation of the Bayh-Dole Act. This clause permits domestic small business and domestic nonprofit organizations to retain title to subject inventions. Therefore, small businesses and nonprofit organizations do not need to request a waiver.

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES.

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.